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Korea, Republic of

Grain and Feed

North Korea Agricultural Situation

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Report Highlights:

South Korea's Rural Development Administration estimates that North Korean grain output in 2004 was 4.3 million metric tons (MMT), a 1.4 percent increase from a year earlier. South Korea's Rural Economic Institute (KREI) estimates that if sufficient agricultural inputs were available, the production of food grains in North Korea, including potatoes, in a typical year should be approximately 5.0 MMT. KREI also estimates that, if North Korea were to use crop cultivation practices and inputs available in South Korea, the North's food grain production could increase to 6.0 MMT. If average per capita daily caloric intake were to be at internationally acceptable minimal levels, North Korea would need annual supplies of at least 6.6 MMT of grains.

Includes PSD Changes: No
Includes Trade Matrix: No
Unscheduled Report
Seoul [KS1]
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Production

The Rural Development Administration (RDA), the South Korean Ministry of Agriculture and Forestry's research and extension agency, recently published its annual North Korean crop estimate for 2004. The estimate is based on in-house, field-based research coupled with information gleaned from various domestic and international research organizations.

RDA estimates that North Korea grain output in calendar year 2004 was 4.3 million metric tons (MMT), representing a 1.4 percent increase from a year earlier. Favorable weather for rice and other field crops resulted in improved yields for principal crops. However, corn suffered from frequent rain during pollination, disease outbreaks and insects infestations. Total precipitation amounted to 816.3 millimeters, 87.4 percent of average. Application of fertilizer was estimated at 1.0 MMT in 2004, only half the total requirement. South Korea provided 300,000 MT of fertilizer as aid in 2004. The first 200,000 MT was provided during the planting season and the remainder in November and December.

Rice output was estimated at 1.80 MMT, an increase of 4.6 percent over the 2003 crop. Higher output was due to better yields, which resulted from favorable weather during the growing period and warmer temperatures during the filling stage.

Corn production was estimated at 1.67 MMT, a decrease of 2.4 percent from a year earlier. This reduction was due to rainy conditions during pollination, insect damage, and plant diseases.

The combined production of wheat, barley and beans was estimated at 0.26 MMT, an increase of 4 percent over the previous year thanks to an increase in area planted and favorable weather.

Potato production was estimated at 0.45 MMT on a grain equivalent basis, down 4.3 percent from a year earlier despite an increase in area.

On the basis of the World Food Program (WFP) 2004 crop report, the Korea Rural Economic Institute (KREI) (a South Korean institute) estimates that if sufficient agricultural inputs were available, the production of food grains in North Korea, including potatoes, in a typical year should be approximately 5.0 MMT. KREI also estimates that if North Korea used crop cultivation practices and seed varieties available in South Korea, and if it increased its double-cropped area to 250,000 HAs, its food grain production could increase to 6.0 MMT.

Consumption

KREI recently estimated that 2004/05 demands for total grains in North Korea is approximately 5.1 million MT. This assumes an average per capita daily caloric intake in North Korea of 1,600 kcal (equivalent to 167 kg per capita per annum), which is only 75 percent of the average of the internationally accepted minimum daily per capita caloric intake of 2,130 kcal. If average daily consumption in North Korea were to reach levels normally considered as the acceptable minimum, food grain demand would increase to approximately 6.6 MMT. Given that, since 1997, food grain supplies (including domestic production and food aid) have been in the 5.0 to 5.5 MMT range, average daily per capita caloric intake in North Korea has hovered in the 75 to 83 percent range of what is considered minimally acceptable.

Humanitarian Aid

From 1995 to 2004, South Korea has provided North Korea with humanitarian aid worth US\$ 1.2 billion composed of US\$ 736 million from the Korean government and US\$ 425 million from NGOs.

In 2004, the Korean government supplied 100,000 MT of Chinese corn to the North through the World Food Program (WFP) and 300,000 MT of fertilizer directly. Korean NGOs, including the Korean National Red Cross, also provided US\$ 141 million worth of food, feed, powered milk, wheat flour, agricultural materials, etc.

In 2005, North Korea requested that South Korea supply it with 500,000 MT of fertilizer through the Red Cross. Political pressure, however, has brought grants of fertilizer to a standstill.

Grain Aid on Long-Term Credit

Since 2000, South Korea has also provided North Korea with food grains on a long-term credit basis. Only interest payments are due during the first 10 years of the 30-year repayment period. The loans have an interest rate of one percent.

In 2004, from July to October, the South Korean government sold North Korea 100,000 MT of domestic rice for US\$ 300/MT, and between July 2004 and February 2005, it sold North Korea 300,000 MT of Thai rice for US\$ 294/MT. The total value of this 400,000 MT of grain aid was US\$ 118 million.

North Korea: Total Supply of Grains (1,000 MT)			
Crop Year	Production 1/	Imports	Total Supply
1991	4427	1,290	5,717
1992	4268	830	5,098
1993	3884	1,093	4,977
1994	4125	490	4,615
1995	3451	1,116	4,567
1996	3690	1,050	4,740
1997	3489	1,710	5,199
1998	3886	1,189	5,075
1999	4220	1,079	5,299
2000	3590	1,225	4,815
2001	3946	1,400	5,346
2002	4130	1,405	5,535
2003	4250	1,209	5,459
2004	4310	na	na

1/ Includes potatoes (on a grain equivalent basis) and oilseeds.

Source: Rural Development Administration, Korea Trade-Investment Promotion Agency, and Ministry of Unification

North Korea: 2004/05 Estimated Demand for Food Grains (1,000 MT)			
Purpose	Status in 2004/05 1/	Actual Demand Required on Basal Metabolic Rate 2/	Required Demand Equivalent to South Korea 3/
Food	3,959	5,263	4,951
Feed	181	300	4,798
Seed	230	230	230
Others	762	793	699
Total	5,132	6,586	10,6789

1/ Assumption I: total population (23.7 million), per capita annual grain consumption (167 kg) based on a daily intake of 1,600 kcal per person i.e. 75 percent of 2,130 kcal which is internationally accepted as the minimally acceptable per capita daily energy intake. Seed use is calculated at 97.5 kg per HA for rice, 45 kg per HA for corn, 2,500 kg per HA for fresh potatoes, and 200 kg per HA for wheat, barley and other grains. Others include harvest loss applied at 15 percent of total production and other loss at 3 percent of total estimated consumption. Rice milling rate is estimated at 65 percent. Potatoes are measured on a 4:1 grain equivalent basis. Demand for animal feed is applied by data estimated by North Korean government authorities. (Source: FAO/WFP, Special Report: FAO/WFP Crop and Food Supply Assessment Mission to the Democratic People's Republic of Korea, Nov. 22, 2004.)

2/ Assumption II: total population (23.7 million), per capita annual grain consumption (222 kg) based on an average daily intake of 2,130 kcal (which is an internationally accepted minimally acceptable daily per capita caloric intake level and which assumes that 1 gram of grain is equivalent to 3.5 kcal). Demand for animal feed is estimated using the average demand of animal feed in North Korea for 2000-2002. Other factors are the same as in Assumption I.

3/ Assumption III: total population (23.7 million), food demand includes grains for processing; feed demand is estimated using annual per capita feed grain consumption in

South Korea. Others assumptions include a harvest loss of 10 percent of total production and other losses of 3 percent of total estimated consumption. (Source: MAF)

Source: Korea Rural Economic Institute

North Korea: Perspective of Grain Production			
1. Grain Production in 2004/05 a/			
Crop	Area (1,000 HA)	Yield (MT/HA)	Production (1,000MT)
Milled Rice	583	2.64	1,541
Corn	495	3.49	1,727
Potato d/	89	2.90	258
Other f/	60	1.99	119
Wheat e/	70	2.37	166
Barley e/	32	2.04	64
Potato e/	100	2.56	255
Total	1,428		4,130
2. Scenario 1 b/			
Crop	Area (1,000 HA)	Yield (MT/HA)	Production (1,000MT)
Milled Rice	583	3.48	2,029
Corn	496	4.00	1,984
Potato d/	89	3.25	289
Other f/	54	1.76	95
Wheat e/	63	2.50	158
Barley e/	39	2.00	78
Potato e/	109	3.00	327
Total	1,433		4,960
2. Scenario 2 c/			
Crop	Area (1,000 HA)	Yield (MT/HA)	Production (1,000MT)
Milled Rice	580	4.95	2,891
Corn	450	4.10	1,968
Potato d/	100	4.49	449
Other f/	50	2.56g/	128
Wheat e/	80	2.96	237
Barley e/	50	2.16	108
Potato e/	120	3.36h/	403
Total	1,460		6,184

a/ FAO/WFP, Special Report: FAO/WFP Crop and Food Supply Assessment Mission to the Democratic People's Republic of Korea, Nov. 22, 2004.

b/ Assumes sufficient supplies of inputs of agricultural materials and production averages for 1986 to 1988 that were North Korea's best crop years on record.

c/ Assumes cultivation technology and seed varieties are equivalent to those used in South Korea and that double cropped area increases to 250,000 HA. The increase of potato area offsets the decrease of corn area.

d/ Harvested in the fall.

e/ Harvested in the summer.

f/ Includes sorghum, millet, wheat and barley.

g/ Average yields of wheat and barley.

h/ Assumes that yields are half those of South Korea.

(Potatoes are measured on a 4:1 grain equivalent basis.)

Source: Korea Rural Economic Institute

North Korea: Crop Areas (1,000 HA)						
Year	Rice	Corn	Wheat/Barley	Bean	Potato	Total
2003	582	526	147	126	194	1,575
2004	582	526	161	128	200	1,597
Change (%)	0	0	+9.5	+1.6	+3.1	+1.4

Source: Rural Development Administration

North Korea: Comparison of Rainfall (Millimeters)				
Year	April-May	June-September	October	Total
Average	131.8	670.1	32.4	934.3
2004	153.3	657.8	5.3	816.3

Source: Rural Development Administration

North Korea: Grain/Staple Food Production (1,000 MT)							
Crop Year (CY)	Grand Total	Beans 1/	Potatoes 1/	Grains			
				Total	Rice 2/	Corn	Others 3/
1985	5311	535		4776	2113	2536	127
1986	5939	545		5394	2387	2864	143
1987	5575	560		4015	2219	2663	133
1988	5376	565		4811	2129	2554	128
1989	5516	565		4951	2142	2680	129
1990	4861	565		4296	1800	2380	116
1991	4427	207	373	3847	1641	2120	86
1992	4268	218	312	3738	1531	2112	95
1993	3884	197	312	3375	1317	1963	95
1994	4125	173	240	3712	1502	2138	72
1995	3451	129	158	3164	1211	1851	102
1996	3690	121	147	3420	1340	1976	106
1997	3489	112	145	3232	1503	1599	130
1998	3886	113	154	3619	1461	1947	211
1999	4220	120	310	3780	1630	1920	230
2000	3590	123	390	3090	1425	1440	212
2001	3946	88	437	3421	1680	1588	153
2002	4130	100	450	3580	1730	1640	210
2003	4250	100	470	3680	1720	1710	250
2004	4310	130	450	3730	1800	1670	260

1/ USDA data for CY 1985-1990 is for "millet" but is believed to include potatoes and beans. Potatoes are measured on a 4:1 grain equivalent basis.

2/ Milled basis.

3/ Other grains such as wheat, barley, sorghum, and millet.

Source: USDA prior to MY 1990/91. Ministry of Unification, Rural Development Administration since MY 1990/91

North Korea: Rice Acreage, Yield and Production (Milled)			
Crop Year (CY)	Acreage (1,000 HA)	Yield (MT/HA)	Production (1,000 MT)
1991	614	2.81	1,641
1992	614	2.68	1,531
1992	614	2.32	1,317
1994	585	2.64	1,502
1995	585	2.07	1,211
1996	580	2.31	1,340
1997	576	2.61	1,503
1998	576	2.54	1,461
1999	580	2.81	1,630
2000	545	2.61	1,425
2001	572	2.94	1,680
2002	576	3.00	1,730
2003	582	2.96	1,720
2004	582	3.09	1,800

Source: Ministry of Unification, Rural Development Administration

North Korea: Corn Acreage, Yield and Production (Milled)			
Crop Year (CY)	Acreage (1,000 HA)	Yield (MT/HA)	Production (1,000 MT)
1991	670	3.16	2,120
1992	660	3.20	2,112
1992	650	3.02	1,963
1994	650	3.29	2,138
1995	650	2.85	1,851
1996	600	3.29	1,976
1997	641	2.49	1,599
1998	629	3.10	1,947
1999	570	3.37	1,920
2000	543	2.65	1,440
2001	543	2.93	1,588
2002	527	3.11	1,639
2003	526	3.25	1,710
2004	526	3.17	1,670

Source: Ministry of Unification, Rural Development Administration

North Korea: Grain Import Estimate per Origin (Unit: 1,000 Metric Ton)											
Year	China	Syria	Thailand	Canada	Japan	EU	Others 1/	Sub total	Korea		Grand Total
									G/vt	Private	
1991	300	0	90	350	0	0	550	1,290	0	0	1,290
1992	620	0	20	80	0	0	110	830	0	0	830
1992	740	0	78	160	0	0	115	1,093	0	0	1,093
1994	305	0	52	0	0	0	133	490	0	0	490
1995	153	0	162	0	370	0	277	962	150	4	1,116
1996	547	140	30	0	132	115	301	1,050	0	0	1,050
1997	867	34	38	0	-	82	576	1,630	0	80	1,710
1998	288	104	-	0	59	20	579	1,112	0	77	1,189
1999	238	61	-	0	-	40	751	1,070	0	9	1,079
2000	283	-	284	0	106	22	512	1,225	0	0	1,225
2001	436	5	-	0	500	0	437	1,400	0	0	1,400
2002	219	-	200	0	-	0	586	1,005	400	0	1,405
2003	349	-	95	51	0	10	304	809	400	0	1,209
2004 2/	na	na	300	na	na	na	100	na	105	na	na

1/ Includes grains supplied through international organization such as WFP.

2/ Under Korean government food aid program.

Source: Korea Trade-Investment Promotion Agency, and Ministry of Unification

North Korea: Grain Aid on Long-Term Credit by South Korean Government					
Year	Commodity	Quantity (MT)	Price (US\$/MT)	Amount (million US\$)	Origin
2000	Corn	200,000	109	22	China
	Rice	300,000	220	66	Thailand
2002	Rice	400,000	265	106	South Korea
2003	Rice	400,000	265	106	South Korea
2004	Rice	100,000	300	30	South Korea
	Rice	300,000	294	88	Thailand

Source: Ministry of Unification

North Korea: Status of Aid to DPRK (US\$ Thousand)					
Calendar Year	South Korea			International Aid Organizations	Total
	Government	NGOs	S. Total		
1995	232,000	250	232,250	55,650	287,900
1996	3,050	1,550	4,600	97,650	102,250
1997	26,670	20,560	47,230	263,500	310,730
1998	11,000	20,850	31,850	301,990	333,840
1999	28,250	18,630	46,880	359,880	407,760
2000	78,630	35,130	113,760	181,770	295,530
2001	70,450	64,940	135,390	357,250	492,640
2002	83,750	51,170	134,920	257,680	392,600
2003	87,020	70,610	157,630	139,320	296,950
2004	115,120	141,080	256,200	163,230	419,430
Total	735,940	424,770	1,160,710	2,177,920	3,338,630

Source: Ministry of Unification

North Korea: Humanitarian Aid from South Korean Government		
Year	Amount (US\$ million)	Details of Aid
1995	232	- 150,000 MT rice produced in South Korea
1996	3	- WFP, \$2 million (3,409 MT mixed grain) - UNICEF, \$1 million (203 MT milk powder) - WMO, \$50,000 (Meteorological equipment)
1997	27	- WFP, \$6 million (9,852 MT mixed grains) - UNICEF, \$0.34 million (Cost for oral rehydration salt factory) - WFP, \$10.5 million (50,000 MT of corn, 300 MT milk powder) - UN organizations: \$9.8 million: WFP \$4 million (8,389 MT CSB); UNICEF \$3.6 million (781 MT milk powder); WHO \$ 0.7 million; UNDP \$1.2 million; FAO: \$0.3 million.
1998	11	- WFP, \$11 million (30,000 MT corn, 10,000 MT flour)
1999	28	- 115,000 MT fertilizer (Direct aid)
2000	79	- 300,000 MT fertilizer (Direct aid)
2001	70	- 150,000 pieces of inner wear (Direct aid) - 200,000 MT fertilizers (Direct aid) - 100,000 MT corn via World Food Program (WFP) - Malaria prevention medicines through WHO
2002	84	- 100,000 MT corn via WFP (\$17.4 million) - Malaria prevention medicines via WHO (\$0.6 million) - 300,000 MT fertilizer (\$70.7 million)
2003	87	- 100,000 MT corn via WFP (\$16.19 million) - 300,000 MT fertilizer (Direct aid, \$ 66.98 million) - Malaria prevention medicines via WHO (\$0.66 million) - Nutrient food for children and medicine via UNICEF (\$0.5 million)
2004	115	- 100,000 MT corn via WFP (\$24 million) - 300,000 MT fertilizer (Direct aid, \$ 88.51 million) - Malaria prevention medicines via WHO (\$0.67 million) - Nutrient food for children and medicine via UNICEF (\$1 million)

		- Emergency aid after the explosion of Royong-Chon Station and other aid via WHO (\$0.94 million)
Total	736	

Source: Ministry of Unification

North Korea: Humanitarian Aid by NGOs		
Year	Amount (US\$ million)	Details of Aid
Nov. '95 ~ May '97	5	- Korea National Red Cross 3,664 MT wheat flour, 96 MT powdered milk, 10,000 blankets, 186,000 liters of vegetable oil, 100,000 boxes of instant noodle, 35,000 pairs of socks, 1,900 MT potatoes, 4.8 MT radish seed, 6.4 MT cabbage seed and 4,980 MT corn
1997	17	- Korea National Red Cross 58,611 MT corn, 14,576 MT Indian millet, 5,501 MT wheat flour, 270,000 liters of vegetable oil, 1,300 MT potatoes, 96.74 MT baby food, 100 MT powdered milk, 30,000 sets of children's nutritive tablets
1998	21	- Korea National Red Cross 800 MT fertilizer, 16,509 MT corn, 13,500 MT wheat flour, 260,000 liters of vegetable oil, 111 MT powdered milk, 2,500 MT fertilizer, 1,000 MT salt, 57 MT rice, 5 MT potato seed, 26,000 pair of socks, 500 head of cattle, 3.4 MT vinyl, 14 MT chocolate, medicine, 1 unit of ambulance - Chung Ju-young: 39,509 MT corn, 501 heads of cattle (85 MT livestock feed, 205 sets of water flask) - NGOs: 4,010 MT corn, 2,000 MT wheat flour, 60 MT rice, 128 MT powdered milk, 34 MT sugar, 356,700 liters of vegetable oil, 200 heads of dairy cattle, 46 MT livestock feed, 50.8 MT vinyl, 984 pieces of glass, 45,904 pieces of clothing, 1 set of X-ray examining car, medicine
1999	19	- Korea National Red Cross (Mar.30~Jun.5): \$10.3 million (Fertilizer 40,000 tons) - Korea National Red Cross and 24 civic groups: \$2.8 million (3,139 MT wheat flour, 4,015 MT corn, 42 MT powdered milk, 165 MT sugar, 180 MT potato seed, 15,845 liters of vegetable oil, 9,930 boxes of instant noodle, 215,448 pieces of clothing, medicine, etc.) - 10 NGOs: \$5.54 million (36,853 pieces of clothing, 1,000 MT wheat flour, 100 MT fertilizer, 1,000 sets of water sprayer, 5,000 shovels, X-ray examining vehicle (1), 4 sets of ultrasonographic and other medical device, nutritive tablet, Milk sterilizer tank (2), cream collector, veterinary medicine, Pharmaceuticals, raw materials for greenhouse, 1.5 MT potato seeds, 24, 871 pieces of clothing, 384 MT fertilizer, medical devices for dentist, 52 MT sugar, 30 MT powdered milk, note, pencil, 2 ambulance cars, medicine, 46,500 pieces of clothing, 1,000 MT corn, 51

		MT wheat flour, 300 boxes of instant noodle, 500,000 eggs, 595 MT tangerines, Potato seeds, \$1.2 million of S-N economic cooperation fund, 1,000 MT fertilizer, 3,000 MT corn, 5,500 pieces of clothing, 6,828 pieces of clothing, 5,000 pair of shoes)
2000	35	<ul style="list-style-type: none"> - Korea National Red Cross: \$9.42 million (20 MT rice for rice cakes, tangerines, 11 sets of pediatric medical devices, 59 kinds of medicine, wheat flour, fertilizer, agro-chemicals, container for fertilizer production, 500 heads of cattle, toys, fabric, clothing, blanket, etc) - NGOs: \$25.7 million (60 MT bean for livestock feed, 2,000 pairs of socks, 2,000 pairs of shoes, 6 boxes of medicine, 5.5 MT insecticide, 3,701 MT tangerines, 15 million of eggs, coke, juice, 1,400 MT potato seeds, clothing, agro-chemicals, wheat flour, stationery, cotton fabric, milky goat, 10,000 handcarts, 8,000 pieces of winter jacket, 10,000 pairs of socks, 2,000 pairs of gloves, 4 ambulance cars, 50 hospital beds, 260 boxes of medicine, 100 sprayers, boilers, 500 bikes, 1,000 MT wheat flour, raw hydro phonic materials, 101 MT sugar, 72 MT milk powder, 117 MT wheat flour, 802 MT fertilizer, 721 MT corn, 2,000 sprayers, 52.5 MT sugar, 20 MT milk powder, fabric, 32,000 pieces of clothing, 15 MT powdered milk, sneakers, and 1,200 shovels, 21 sets of anti tuberculosis drug, medical devices, 6 X-ray examining vehicles, tractor, water pump, greenhouse equipment, fertilizer, wheelchair, 5,479 pieces of clothing, 300 MT vegetable oil, household goods.
2001	65	<ul style="list-style-type: none"> - Korea National Red Cross: \$22 million (3,150 MT pear, 4,000 MT apple, 5,000 MT potatoes, 552 MT vinyl for rice field, 2,000 MT carrot, 23 MT powdered milk, 2 MT baby food, antibiotic medicine, 759 pieces of blanket, 1,590,000 pieces of underclothes, 550,000 of salmon, 10 units of ambulance and other medicines) - 19 NGOs: \$42.9 million (Pharmaceuticals, medical devices, clothing, agricultural machinery, fertilizer, wheat flour, sugar, powdered milk, agro-chemicals, stationery, equipments for greenhouse, livestock and feed) - UNICEF Korea Council: 2.3 million tablets of vermicide (\$684,843)
2002	51	<ul style="list-style-type: none"> - Korea National Red Cross: \$7.2 million (1,180,000 pieces of underclothes for winter, 390,000 units of instant noodles (ramyon), 5,200 women's winter coats, 100,000 cans of powdered milk, 500 MT printing paper, stationery sets, sneakers, antibiotics, baby food, milk powder, textiles, agricultural machinery, blankets) - 25 NGOs: \$44 million (Pharmaceuticals, medical devices, clothing, agricultural machinery, wheat flour, sugar, powdered milk, agro-chemicals, stationery sets, equipments for greenhouses, livestock and feed, etc.)
2003	71	<ul style="list-style-type: none"> - Korea National Red Cross: \$ 5.8 million (wheat flour, agricultural machinery and necessities). - 29 NGOs: \$64.75 million (medical equipments,

		medicine, agricultural machinery equipment, dairy processing equipment, construction materials, wheat flour, powdered milk, sugar and clothes)
2004	141	- Korea National Red Cross: \$ 32.6 million (wheat flour, powdered milk, sneakers, coal) - 33 NGOs: \$ 83 million (wheat flour, sugar, agricultural equipment, greenhouse materials, boiler, stationary, clothes, tangerine, construction materials, medicine, antibiotics, medical devices)
2005 Jan.	8	- 14 NGOs: \$7.74 million
Total	433	

Source: Ministry of Unification